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DE RUEHSA #0810/01 1131030
ZNR UUUUU ZZH
R 231030Z APR 09
FM AMEMBASSY PRETORIA
TO RUEHC/SECSTATE WASHDC 8218
INFO RUCPDC/DEPT OF COMMERCE WASHDC
RHEBAAA/DEPT OF ENERGY WASHINGTON DC
RUEHC/DEPT OF LABOR WASHDC
RUEHBJ/AMEMBASSY BEIJING 0973
RUEHBY/AMEMBASSY CANBERRA 0832
RUEHLO/AMEMBASSY LONDON 1736
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UNCLAS SECTION 01 OF 04 PRETORIA 000810

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SUBJECT: South Africa makes slow progress on renewable energy, but has ambitious plans

REF: Pretoria 510

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¶1. (SBU) Summary. South Africa is a coal-based economy and little attention to date has been given by the government and the private sector to the country's significant renewable energy potential. Even the minimal target set for renewable energy in the country's energy mix by 2013 is likely to be missed by a wide margin. The country does not have a viable and sustainable renewable energy industry. Delegates to the South African Renewable Energy Summit March 19-20, 2009 outlined the benefits of using renewable energy sources and expressed dissatisfaction at the government's lack of support for the industry. Delegates believe that renewable energy is the future for South Africa and that the technology will drive economic growth. Bilateral cooperation in renewable energy could be a good opportunity for the U.S. DOE to work with the Department of Minerals and Energy (DME). End Summary.

Purpose of the Summit

¶2. (SBU) Energy Officer and Specialist joined more than 400 delegates at the South African Renewable Energy Summit organized by the DME at Swan Lake Conference Centre, Centurion, March 19-20, ¶2009. The aim of the Summit was to undertake a mid-term review of progress made since approval of the government "White Paper" on Renewable Energy produced in 2003. The DME also aimed to agree on a new set of resolutions, policy direction, and action plans to rapidly scale up and streamline the implementation of renewable energy (RE) in South Africa.

SA Coal-Based and Likely to Remain So

¶3. (SBU) Coal supplies about 90 percent of South Africa's electricity and 23 percent of its liquid fuels. Also, 28 percent of domestic coal production is exported earning 18 percent of total mineral export revenues (reftel). South Africa has been identified as the 14th biggest emitter of carbon dioxide (CO2) in the world and hosts the biggest single point source emitter, Sasol's coal to liquids (CTL) plant in Secunda. South Africa has large coal (and uranium) reserves, but only minor reserves of oil, natural gas, and hydro potential. It is also in the midst of an electricity crisis with a generation safety margin that varies between 5 percent and 8 percent, depending on peak demand and generator availability. The country's current total capacity is about 41 gigawatts (GW) and plans are to increase this to 60-80 GW by 2025.

¶4. (SBU) The objectives encompassed in the government's electricity new-build program are energy security, diversified supply, and reduced CO2 emissions. The initial program included 4hGJVthwhich is still in the research Qpebble bed modular reactor (PBMR), which is still in the research phase, with construction of a prototype planned for 2013-14. The first-phase "Nuclear 1" of 3.5 GW of the 20 GW of nuclear power construction has been postponed because of cost and the economic crisis. The SAG has stated that it is committed to nuclear and is reviewing its options, which it states will be made public toward the end of 2009. The other 20 GW will comprise three or four 4.8 GW coal-fired plants, two of which are already under construction, a third is "on the drawing board", and a fourth will be considered if the nuclear option is further delayed.

South Africa's Renewable Energy Potential

PRETORIA 00000810 002 OF 004

¶5. (SBU) South Africa has significant potential for power

generation using renewable energy sources. These include:

- Large areas of semi-desert with relatively uninterrupted solar radiation during daylight hours;
- On- and off-shore strong wind flows along the western and eastern coast;
- Strong uninterrupted ocean currents along the east (Mozambique current) and west (Benguela current) coasts.

Each of these sources has the potential to supply the country's total energy needs if the appropriate technologies can be scaled up and commercialized to be affordable.

South Africa Lacks a Renewable Energy Industry

¶6. (SBU) The SAG committed to implementing 10,000 gigawatt hours (GWh) of renewable energy by 2013 at the World Summit on Sustainable Development held in Johannesburg in 2002. This represents 3-4 percent of the country's total annual power capacity. (Note. One wind turbine with a generation capacity of about 1.14MW, operating constantly for one year or 8,760 hours, would output 10 GWh of consumable electricity. It would require 1,000 such turbines to produce the 10,000 GWh required. End Note.) In fact, little has been accomplished to date, apart from two three-turbine wind farms of about 5-6 MW each -- funded by the Danish government and South Africa's power utility Eskom, respectively -- and a few biomass and solar-heating installations. Minister of Minerals and Energy Buyelwa Sonjica acknowledged in her opening address to the Renewable Energy Summit that South Africa had made little progress toward the goal of 10,000 GWh of renewable-energy capacity by 2013.

¶7. (SBU) The country's reliance on cheap, available coal has discouraged the development of renewable energy. Renewable energy has been deemed to be too costly and a "rich country's option" with little ability to satisfy the bulk power demands from South Africa's high energy-intensive industries such as mining, smelters, refiners, and CTL conversion plants. As a result, there has been little pressure on government to provide funds for research and development or to set meaningful targets and timetables for the development of renewable energy. However, pressure has come from the Department of Environment and Tourism (DEAT) to mitigate CO2 emissions in the interests of retarding climate change. After years of vacillating, the SAG and the DME appear to be finally responding.

The Minister's Address

¶8. (SBU) The Minister of Minerals and Energy admitted in her opening address at the summit that the country had only managed to achieve three percent of its target of 10,000 GWh (by 2013) in the five years since the White Paper on Renewable Energy was approved in 2003. Some delegates disagreed and gave their own estimate as 0.6 percent of the target achieved. The minister said a number of Qpercent of the target achieved. The minister said a number of constraints related to policy and capacity, such as a proper legislative framework and regulatory policies, had prevented government from making progress in fostering renewables. There was also a lack of funding and manufacturing capacity. She said South Africa's low electricity tariffs had played a major role in restricting investment and lack of intra-government department coordination had retarded growth of a renewable energy industry. DME Director General Sandile Nogxina said the challenges were not insurmountable, but acknowledged that dedicated programs were needed to support the industry. He said a designated national authority would be created, which would also include a financing subsidiary to assist investors. Nogxina said the government would now focus on the implementation of programs and plans to increase activity in the sector.

PRETORIA 00000810 003 OF 004

Attempts to Kick-Start the RE Industry

¶9. (SBU) Currently the major initiatives to expand use of renewable resources include:

- expansion of test wind farm capacity to 50-100 MW;
- a program to subsidize the installation of 925,000 solar water heaters, which would save some 580 MW of power; and
- Qmerous small private micro-projects in solar, wind, ocean current, tidal, and wave power generation.

Solar water heating has the most immediate potential for grid power savings as the technology is readily available and could save an estimated 2 GW of power if installed country-wide. Unfortunately, the systems are expensive (unaffordable to the majority) and the Eskom subsidy too small. Hence only 800 units have been installed to date under the scheme.

The Way Forward

¶10. (SBU) Delegates from the Renewable Energy sectQecognizedQat coal (and perhaps nuclear) would remain the dominant energy sources for the medium future (25-35 years) and beyond. They also acknowledged that renewable energy technology would take 50-years and more to mature to deliver base-load power reliably and sustainably. Delegates proposed:

- Renewable technology implementation needs to "start small" and provide niche and distributed power as opportunities arise. These included replacement of electric geysers (as they failed and in new buildings and homes) with solar water heaters, solar power for traffic lights, wind power for off-grid and rural communities, and others;

-- Government needs to take a bold, enabling approach to setting meaningful targets and timelines for implementation of renewable energy and to monitor progress;
-- Government and industry need to cooperate in establishing and funding facilities for skills training and research to bring new and innovative renewable energy technologies to the market at an affordable price;
-- The energy regulator needs to establish the feed-in price for renewable electricity into the national grid and to set the electricity price to consumers to reflect this. The National Energy Regulator of South Africa (NERSA) is currently evaluating two options, one based on tenders, which would eliminate the highest cost producers, and the other based on a set price that would allow all producers of renewable energy to participate, the so-call REFIT or renewable energy feed-in tariff. Delegates believe the wind REFIT may be adequate for investors, but the solar REFIT may end up too low. (Note: NERSA at the end of March approved the wind REFIT at R1.25 per kWh (\$0.14) and the concentrated solar REFIT at R2.10 per kWh (\$0.23). Eskom's current tariff rate for coal-generated electricity ranges from about R0.10 or \$0.01 (low demand) to R0.80 or \$0.09 (peak demand) per kWh. End Note.)

Comment - An Opportunity for U.S. Support

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11. (SBU) The Renewable Energy Summit was filled with 400 passionate and knowledgeable people with practical suggestions and solutions. Many fervently believe that renewable energy is the technology of the future that will provide the next technology wave (similar to computers, micro-chips, mobile phones, and the Internet) and a sustainable long-term energy future. Delegates acknowledged that full implementation of renewable energy would take time and likened it to a marathon race where endurance and steady progress are preferable to reach the goal, rather than a fast start with the probability of a break down along the way. South Africa is at the

PRETORIA 00000810 004 OF 004

beginning of its quest to increase power from renewable energy sources and needs assistance. This presents a major opportunity for DOE and other agencies to provide assistance to the DME in areas such as experience, technology, and skills education and training in technical, regulatory, and project management.
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